ABSTRACT

A peer-to-peer (P2P) search request message may multicast from an originating peer to its neighboring peers. Each neighboring peer may multicast the request message in turn until a search radius is reached. Each peer receiving the request message may conduct a single node search. If the single node search is successful, a P2P search response message may be generated. Each receiving peer may filter duplicate messages and may multicast to less than 100% of its neighbors. Responses may be cached and cached responses sent in response to request messages, expanding the effective search radius of a given P2P search. The multicast probability for a neighbor may be a function of how frequently the neighbor has previously responded to a particular search type. To reduce abuse by impolite or malicious peers, in addition to rate-based throttling, originating peers may be required to solve a computationally expensive puzzle.